Introduction

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> What kind of world is being carved out with the destruction of natural forests? with the creation of artificial ones? with the depletion of fuelwood and the accretion of pulpwood? Where do people fit into the picture? What do governments do? How do the interests of the rich and the poor intersect and clash in forests? What is the nature of property rights in forests? Are there multiplier effects from forest-industry development? Who are the beneficiaries, who the victims of growth? . . . Globalization and restructuring produce both benefits and losses; in some regions the benefits are shared by local communities and workers; in others, only the costs are shared.
>
> PATRICIA MARCHAK, *Logging the Globe*

Replies to the questions Marchak has raised (1995, 9) about the consequences of destroying natural forests are complex and often ardently contested. As global forces have converged on western Pacific forests, debate over the consequences of rapid resource extraction has intensified. Participants in the discussion include local resource owners, politicians, corporations, development experts, conservationists, natural and social scientists, and the media. From every perspective, the stakes are high, and various "stakeholders" deploy powerful rhetorics and tactics to advance their position.

In this special issue we have tried to represent multiple perspectives and to comment on some of the arguments that are used to negotiate claims and access to forest resources, specifically timber; however, the points of view presented here do not cover the full range of voices and stakeholders

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involved. Major developments in recent years with respect to government policy and logging are brought into perspective by authors with varying experience in relation to the industry. Local and gendered perspectives on desirable forms of development and on the impact of logging are lacking, despite our efforts to find authors to represent these views.[1]

Papua New Guinea, Solomon Islands, and Vanuatu constitute a distinctive case in the history and geography of tropical forest exploitation. Their biodiversity is great, and their island ecosystems are vulnerable to exploitation by development. They have only recently become independent, democratic nation states (Papua New Guinea in 1975; Solomon Islands, 1978; Vanuatu, 1980). Their role in the world logging market as suppliers of raw logs is as important as their political and economic position in the Asia-Pacific region. Their cultural heritage is Melanesian, and they recognize indigenous systems of customary land ownership to an extent without parallel in the world. In these countries development in forestry or any other industry requires consistent consultation to produce acceptable distribution of rewards among resource owners and business interests.

This introduction provides a brief overview of logging in the context of worldwide deforestation, presents some basic data on the progress of commercial logging in the three Melanesian countries considered here,[2] and identifies some of the rhetorics used to argue for and against development of timber resources (eg, development, nationalism, sustainability, management, and conservation).

Logging and Deforestation: A Global Issue

Logging of lowland rainforest in Papua New Guinea, Solomon Islands, and Vanuatu is part of the larger process of global deforestation. Despite the remoteness and relatively small size of these island nations, natural scientists consider them to play a crucial role in processes of global change and regional ecology.

Estimates concerning the long-term consequences of deforestation vary greatly in extent, time-frame, and scale. Such estimates are used to argue for or against access to forests for logging, agriculture, or subsistence uses, and how these estimates are used often reveals underlying commitments to a wide variety of issues, such as progress, technology, naturalism, and spiritualism. In debates about whether and how logging should occur, interpretations are made about the ecology of rainforests—their

fragility or regenerative potential, the effects of disturbance, domino effects on plant and animal species, and the extent to which they represent natural (pristine) versus humanized landscapes (Uhl, Nepstad, Buschbacher, Clark, Kauffman, and Subler 1990). General claims should be examined carefully for their appropriateness to particular locations and circumstances.

Natural scientists tend to agree that logging is the main contributing factor in the larger process of deforestation, which has worldwide effects on global warming, hydrologic cycles, greenhouse gas exchanges, sea levels, regional climate changes, and localized ecosystems (Lawson 1986). Once old-growth forests[3] have been harvested, it is virtually impossible to recover the same ecosystem in all of its diversity (Myers 1992, 45). In most cases, logging old-growth forests touches off an irreversible process through which land is converted to other uses, such as sustained yield forests, managed secondary growth, monocrop plantations, agriculture, grasslands, or severely devastated and uninhabitable landscapes. The outcomes depend on how logging is done and how much effort is invested in planning for its aftermath.

The ecological consequences of clear-cut logging, the most widespread technique now in use, are immense. As early as 1977, Winslow warned that because western Pacific rainforests were among the largest and most "undisturbed" in the world, they would be especially vulnerable to exploitation by foreign companies (1977, xvii). Disturbance of ecological stability with widely ramifying effects is a primary concern.[4] Western Pacific forests contain levels of biodiversity and endemic species that far exceed those of temperate climates and most other tropical areas (ADB 1992; Myers 1988; Sekhran and Miller 1995). As scientists learn more about the importance of diversity for both ecological stability and adaptation, there is increasing alarm over extinction of large numbers of species through environmental overexploitation and degradation.

The special characteristics of rainforests raise other concerns. As the oldest stable ecosystems on earth (Brown and Press 1992), tropical forests are characterized by reproductive cycles that are highly integrated among plant and animal species. Many seed-producing plants, sensitive to the disruptions caused by clearing, are not well adapted to disperse seeds widely (Saulei 1985). Full regeneration following large-scale logging may thus require very long time periods (some estimates are as high as six hundred to a thousand years; Myers 1992, 90). Furthermore, the greatest

concentration of vegetation nutrients in rainforests is in the canopy of vegetation rather than in the soils (Foelster 1986), which can be especially fragile and poor in nutrients. Logging such areas leaves cleared areas where soils will not sustain subsequent agricultural uses without extensive and expensive fertilization programs, if at all (Lal 1986; Myers 1992; Nye and Greenland 1964; Clarke and Thaman, this volume).

Schemes currently underway in the western Pacific to log rainforests and replace them with commercial agricultural projects, such as oil-palm plantations, may be unsuitable. They will definitely result in drastic reduction of biodiversity.[5] Research in the Gogol area of Papua New Guinea supports the general case just described. There, a single cycle of selective (not clear-cut) logging has only a minor effect on biodiversity, and the forest regenerates fairly quickly; but if logging infrastructure then makes land cleared by logging available for agriculture, the destruction of the rainforest is complete (Johns 1992).

An important factor in understanding the causes of deforestation is human population growth. One view is that rapidly growing populations in pursuit of agricultural land and fuelwood are the main destroyers of forests (Rich 1982). Elsewhere in the world (Asia, Latin America, and Africa), population pressure virtually eclipses the direct effects of logging as peasant populations rapidly move in to farm areas made accessible by logging. Western Pacific countries are only beginning to experience the effects of their rapidly growing populations. (Annual rates of increase are: for Papua New Guinea, 2.3 percent; Solomon Islands, 3.4 percent; and Vanuatu, 2.22 percent; CIA 1995.) Although there is pressure to convert more land to agricultural uses, population growth does not at this time produce large-scale settlement of logged areas.

Eventually most logged land is converted to some agricultural purpose. Attention has been given to restoring forest cover through deliberate planting, a practice referred to as agroforestry and generally viewed as a positive process that contributes to the recovery of land and the restoration of biodiversity (Clarke and Thaman, this volume). However the term *agroforestry* also refers to industrial plantation projects, usually monocrops, which do little to restore plant species diversity and are extremely vulnerable to pests. Reforestation usually involves planting pine, eucalypts, and other introduced species; it does not replant indigenous tree species. Nevertheless, in Papua New Guinea (PNG) monocrop projects such as oil-palm plantations are proposed as desirable forms of economic devel-

opment in forested areas, and sometimes even serve to disguise large-scale logging operations. Recently, the PNG Forest Authority has issued guidelines for evaluating the extensiveness, fairness to resource owners, and environmental risks of such projects (Joku 1996). There has so far been a greater tendency to produce policy that promotes sustainability than to fund its implementation.

The Global Economy and the Development of Industrial Logging in the Western Pacific

The increasing rate of logging in tropical rainforests is driven by market considerations (Colchester 1993). The price logs fetch on the world market is not linked to their full local use value, cultural significance, or role in complex ecosystems. When these factors are taken into account, logging projects often become economically unfeasible (cf Nadarajah 1994 on the report of a joint project by the Harvard Institute of Development and the National Research Institute of Papua New Guinea to evaluate the Vanimo Timber Project). Recognizing this undervaluation of wood resources, highly industrialized countries protect their remaining forests and search elsewhere for less expensive sources of wood. Rising demand worldwide for wood, paper, and pulp products fuels a growing market for wood. As supplies of wood from some countries are depleted or eventually protected, Asian, American, and European companies with large-scale wood-processing capabilities move on to new frontiers.

In the Pacific, they have shifted their operations from the Philippines to Southeast Asia, including Thailand, Indonesia, Malaysia, and eastward to the western Pacific. Papua New Guinea is generally estimated to have about fifteen million hectares of operable forest, Solomon Islands about seven hundred thousand hectares, and Vanuatu about ten thousand. Their forests contain valuable hardwood species, but an even larger number of unidentified species (Beehler, 1991).

The major consumer of tropical timber as logs, plywood, and sawn wood is Japan, which absorbed 11,695,000 cubic meters in 1995 (Sarawak Campaign Committee 1996[6]). Of Japan's total tropical timber imports, 1,586,000 cubic meters of raw logs were imported from Papua New Guinea, 970,000 cubic meters of raw logs from Solomon Islands, and 970,000 cubic meters of plywood from Malaysia, some of which is manufactured from logs cut in Melanesian countries. The main use is as

plywood for concrete framing (80–90 percent), while the rest is used mostly as wood chips for manufacturing paper, furniture, cabinetry, and veneers (Shimizu and Miyauchi, 1992). Kwila (*Intsia* spp), walnut, pencil cedar, planchonella (*Planchonella* spp), taun (*Pometia* spp), calophyllum, and mersawa *(Anisoptera thurifera)* are used for high quality furniture.[7] Other species are mixed together and used for the inner part of plywood. Korea is another major consumer of log exports, importing approximately 1,040,000 cubic meters from Papua New Guinea in 1994 (Solomon 1995).

Within Melanesian countries, Japanese companies have been there the longest. Other companies from Korea, Singapore, China, and Malaysia are also active. Malaysian companies are rapidly becoming the largest. Japanese companies began to move into Solomon Islands in the early 1960s and into Papua New Guinea in the late 1960s and early 1970s. In Papua New Guinea, Stettin Bay Lumber, JANT, and Open Bay Timber are wholly or partly owned by Japanese companies. They have been negotiating timber rights, providing in-country processing, paying environmental damages, and attempting reforestation in order to maintain their access to timber areas (Shimizu and Miyauchi 1992). About fifty percent of the logging in Papua New Guinea is done by companies that are controlled by one parent company, Rimbunan Hijau, which moved in following restrictions on logging in Malaysia, its home base (Richards 1994). Rimbunan Hijau is a subsidiary of Tiong Toh Siong Holdings. An accurate listing of companies operating in Papua New Guinea that are ultimately owned or controlled through Tiong-related companies is difficult to come by (over twenty-five are referred to in different reports as subsidiaries of Rimbunan Hijau),[8] because ownership records do not always record takeovers, and shares are registered under other names and held by proxy (see PHF 1995). Recently Datuk Tiong has initiated a strategy to shift the family timber operations into a business with shares listed on the Kuala Lumpur Stock Exchange, formerly Berjaya Textiles, now renamed Jaya Tiasa Holdings (Pura 1996).

As logging companies arrive, developing countries with substantial forest resources find themselves in a difficult predicament. Starting late in the processes of industrialization and capitalization, their governments are under extreme financial pressure to alleviate mounting foreign debt. Eager to develop a valuable export commodity, they encourage foreign companies to undertake logging by subsidizing infrastructure, such as

roads and utilities (which such companies need to support their operations), and by granting access to large areas and tax concessions. When logging projects are hit by inevitable downturns in the world market, governments become entangled in further concessions to the companies in order to maintain local economies. It becomes increasingly difficult for them to extract themselves from these commitments in order to restrain the resulting deforestation and avert or address its consequences (Marchak 1995, 13). In Papua New Guinea, this dilemma is evident in environmentally sound legislation that could protect the forest resources and resource owners' interests, but a drastic lack of funding for the Forest Authority, whose charge is to enforce the legislation. The dilemma of extractive entanglements is eminently clear in the ways foreign logging companies shift financial burdens onto local resource-owner companies while reaping large profits themselves. In Solomon Islands, Prime Minister Mamaloni has actively supported industrial logging, which contributes over 50 percent of the national tax revenue (Motufaga 1994). He argues that Solomon Islands is as entitled as any of the more developed countries to use its natural resources for national development.

As tree resources have been depleted in various parts of the world, international lending agencies have tried to pressure governments to regulate the logging industry (for example the General Agreement on Tariffs and Trade [GATT] in 1993 [Marchak 1995], and the recent World Bank decision to withhold part of its loan to Papua New Guinea (Seneviratne 1996). Nevertheless, bribery, corporate pressures, and political influence continue to undermine efforts to regulate the forest industry (Tester and Drover 1996), a situation exacerbated by the fact that large amounts of capital are managed "offshore," that is, outside the regulation of any agency, whether the International Monetary Fund, the World Bank, or a national government (Rich 1995).

Through the ruling political party, Solomon Islands National Unity, Reconciliation and Progressive Pati, the Solomon Islands government has advocated large-scale logging without due recognition of public protests against such practices (see Frazer, Roughan, this volume). Late in 1995, Australia canceled a $2.2 million package of technical assistance for the Solomon Islands forestry sector because of unsustainable forestry practices. Three months later, Malaysia offered to provide aid and expertise to the Solomon Islands logging industry (O'Callaghan 1996). In Papua New Guinea, arrangements with the World Bank for a structural adjustment

plan were stalled by the bank's requirements for better government control of the logging industry.

Regulating the logging industry requires a kind of international cooperation that is difficult to achieve (Marchak 1995, 18). For example, log export bans in the western Pacific, as elsewhere, have proved nearly impossible to enforce. They are nevertheless important for slowing the rate at which logging occurs while infrastructure crucial to regulating the industry is developed. At the 1993 South Pacific Forum, Papua New Guinea, Solomon Islands, and Vanuatu jointly condemned the destruction of forest areas by foreign timber companies and declared their intention to make a united effort to get the situation under control (Henningham 1994). Although all three countries have announced that they will ban the export of raw logs, none has successfully implemented such a ban. At present the timber industry is based mainly on log exports. (For volumes and types of wood exported from Papua New Guinea, see Sekhran and Miller 1995, 50).

Natural resource extraction is, all too often, a boom-and-bust operation in which the local population benefits the least. Following a brief period of access to jobs, money, and commodities, they are left with the consequences—a devastated environment, displacement from homelands, and the difficult choice of becoming unskilled labor in urban areas. For logging projects, these difficulties are exacerbated when land is left in unusable condition (for example with soil too heavily compacted or eroded for agriculture, and water courses silted up), and when not only promises to provide infrastructure such as roads, schools, and clinics remain unfulfilled, but also royalty payments to resource owners are delayed (De'Ath 1980; *Brukim Bus* 1994).

Resource owners, anxious for development and access to the cash economy, find it difficult to imagine these consequences when companies approach them with offers, partly because the vastness of the forest landscape makes exhaustion of the resource seem impossible (De'Ath 1982; *Brukim Bus* 1994). Even after seeing the aftermath and suffering its consequences, some resource owners still believe in logging, but only if the rewards are great enough, as revealed in the following quote from a Trans-Gogol resource owner:

> I have strong feelings on this matter. Jant came and cut down the trees and spoiled the spirits of my ancestors; they spoiled the places where my fore-

> fathers planted their gardens and the place where they took clay for pots. They spoiled these things but they did not help me properly in return with money or something. . . . If Jant paid me a lot of money, then I would be happy with them. . . . I am not cross because they cut timber, but because they did not give me enough in return. . . . I use that forest to find greens to eat, or other things like birds, lizards, bandicoots, cuscus, flying fox which we can cook with taro and eat. (Aloloum 1982)

This scenario of mixed emotions and disappointed expectations has been repeated in all three Melanesian countries considered here, leading one prominent western anthropologist with long-term involvement in the region to observe that these countries are "increasingly trapped in the cycle of pauperization and dependency" (Keesing 1993, 30). Such a depressing prediction is not the inevitable future, but it is a stern warning that the current bases for decision-making must be drastically altered if better alternatives are to be realized.

Much is known about the likely outcomes of logging operations in developing countries where the process has been in place for much longer. The colonial legacy of political and legal systems that alienate land and co-opt its resources for uses determined elsewhere is perpetuated through neocolonial economic imbalances (Bodley 1988; Bennett 1995; Brunton and Barlow, this volume) and by rhetoric about forests as uninhabited places available for exploitation (Dove 1992; Sivaramakrishnan 1995).

In the western Pacific, the distinguishing feature of the struggle over logging is the high value placed on complex and politically sensitive systems of customary land tenure. In Papua New Guinea, for example, over 97 percent of the land is held according to customary systems of stewardship and use (the percentages are only slightly lower in Vanuatu and Solomon Islands). These customary systems are highly variable from one society to another and differentiate claims to resources into many kinds and degrees (Yauieb 1979). These systems are not easily translatable either into the kinds of land registration that British colonialism tried to impose (Keesing 1993) or current contractual systems.

Because management of resources at the local level is organized according to descent-group membership and rights of use, access to resources such as trees is not necessarily the same as a claim to rights to the land itself. Furthermore, at any given time the current users of land-based resources do not represent the full complement of those with rights in land or its resources. At present, the term *landowner* (as noted by Holz-

knecht 1996) has become highly politicized because it sometimes refers most directly to those who are bold enough to claim this role in negotiating with outsider business interests. We therefore adopt Holzknecht's use of the term *resource owner* to cover the broader set of customarily held rights and claims. One representative of a Sepik, Papua New Guinea, resource owners' association outlined their perspective on development and conservation projects:

> All resources are owned by somebody. . . . Plan projects/strategies imposed from outside will not work properly for village land/resource owners. Imposed ideas will be up against local knowledge and practices. . . . Land/resource owners oftentimes have no official government affiliation or recognition, and therefore are vulnerable to extinction. . . . They have in some cases the potential to use illegal methods to express their grievances to the legitimate authorities. (Sumanop 1993, 117–118)

Land or resource owner responses to logging projects include many kinds of protest against the desecration of sacred sites by bulldozers (PHF 1995), continued logging after expiration of the original contract (Kakas 1996), export of undersized logs and logging in a restricted area (Kakas 1993), and failure to pay wages (Joku 1992). Management of rights in resources is crucial to subsistence economies. Abuses of such rights bring a quick response in Melanesian societies and are rightly perceived as threats to their continued autonomy and well-being.

Historically, the incommensurability of indigenous land rights with western concepts of land as property created a persistent puzzle to colonial administrators in Melanesia and was an ongoing source of suspicion and resistance among Melanesians. Lutkehaus described Manam Islanders' efforts to remove or obscure cement markers implanted by the Australian administration to demarcate property boundaries (1995, 43). Allan described how from 1914 onward Solomon Islanders feared "signing any document in case it represented the alienation of land" (1957, 42). Larmour discussed the failure of multiple efforts to develop comprehensive land registration systems in Papua New Guinea, Solomon Islands, and Vanuatu between 1952 and 1982 (1986). Whereas customary land ownership entails the right of constant renegotiation, land registration systems fix boundaries and ownership at a certain point in time and subsequently regulate the transfer of property. Once there is title, the land has potential to be mortgaged and thus alienated. During the summer of 1995, student

protests at the University of Papua New Guinea broke out when it was claimed that the World Bank Structural Adjustment Plan would require registration of land. Even registration systems that claim to follow customary concepts and vest interests in groups rather than in individuals, evoke resistance among Melanesians familiar with western ideas of private property. There is great concern that registration will lead to alienation of land and that profits from land-based resources will be distributed only among an elite few (Routley and Routley 1977, 379; Brunton 1994; Lakau 1996).

Currently, governments, resource owners, conservationists, and loggers all struggle to achieve different goals in the rush to exploit timber resources (Kirsch, this volume). Because of the western Pacific countries' relatively new status as independent and democratic nations, the dialogue between democratic political process and local prestige and authority systems is just beginning (Lipset 1989). Any tradition of "the common good" in a national sense is of fairly recent origin, and both governmental infrastructure and legal precedents are not yet highly developed. Furthermore politicians and businesspeople operate at a distance from their local constituencies, so that the pressure to redistribute resources imposed by face-to-face politics at the village level is also attenuated.

Each of the three countries is following a somewhat different path in accordance with its respective political climate. In Vanuatu, where resource owners have been quite vocal in resisting exploitative logging, the political leadership has supported a culturally conservative and conservationist approach and has succeeded in reining in logging operations. Solomon Islands is experiencing a growing split between local resource holders and government, with escalating levels of violence. In 1994 Prime Minister Francis Billy Hilly took steps to stop exporting round logs (Grynberg 1994). He was voted out of office and replaced by current Prime Minister Solomon Mamaloni, who supports full-scale development based on logging. The rapid pace of tree felling and export has accelerated, and local resource owners are taking more extreme steps to stop logging activities. Papua New Guinea has continually improved its policy and legislation governing the logging industry, but Prime Minister Sir Julius Chan has not taken a strong stand on regulating the industry, and current Forest Minister Andrew Baing continues to try to get amendments passed to the Forestry Act that will give him greater power to grant timber permits (Tannos 1996). When the government was criticized by an

Australian oil man for failing to regulate the logging industry and contributing to growing resource-owner resentment against natural resource development, some politicians rose to the defense of the government, but some of Papua New Guinea's most prominent leaders (Dame Josephine Abaijah, Sir Paulias Matane, and Sir Michael Somare) agreed with him (Robie 1996). Distrust of and disappointment in government is widely and frequently expressed.

Given the short history of the modern political process in these countries, debate over the use and abuse of forests has heated up. Professional media and other communication networks discuss the activities of various parties to the controversy. For example, the logging company Rimbunan Hijau set up its own newspaper, *The National.* In Solomon Islands, a journalist who reported on a large protest march against logging corruption in Honiara claimed that his report had led to the loss of his job (*Solomon Star,* 10 Nov 1995). Journalists protest this kind of interference with a free press (Robie 1994a; Callick 1995; Semel 1996). Others organize communication networks to put forward conservationist points of view and raise awareness in a broader arena about the consistent exploitation of natural resources.

Local people are caught among many efforts to persuade them how best to develop local resources. For some, logging appears to be their best chance to participate in the capitalist system and to gain access to its benefits. For others, it is a massive threat to deeply held values and to local adaptive strategies. For many it involves difficult choices about how to have the best of both worlds.

Nongovernment Organizations and the Politics of Conservation

Concern over the ecological consequences of logging has given rise to many efforts to create and implement strategies for development that are less detrimental to the environment. International conservation organizations (Biodiversity Conservation Network, Conservation International, the Deutsche Gesellschaft fuer Technische Zusammenarbeit, the Nature Conservancy, Greenpeace, and the World Wildlife Fund) and local nongovernment organizations (such as the Foundation for the Peoples of the South Pacific, Soltrust, Solomon Islands Development Trust, Conservation Resource Center, Melanesian Resource Center, Pacific Heritage Foun-

dation, and the East Sepik Council of Women) are organizing campaigns to inform resource owners of the consequences of logging and of poor logging practices, and to propose alternative forms of "development." The range of projects includes small, portable sawmill schemes under local management (Bryant, Stewart, and Walter 1982; Henderson 1994), awareness campaigns using theater (Thompson 1994), drama on national radio (Simet 1996), foot patrols (see Roughan, this volume), and various kinds of literacy campaigns (Nekitel, Winduo, and Kamene 1995). Complicating these efforts is the difficult question of just what "sustainable development" means, given mounting evidence that "human actions, whether through carelessness or need for development, are causing environmental degradation and resource depletion" (ADB 1992).

Nongovernment organizations have been known to disagree among themselves or put themselves at odds with the villagers with whom they work. Their ultimate goals (rainforest conservation versus business development) may be quite different. Disputes among them create competition for resources and followers. Competing proposals to local groups may lead to disagreements about what kinds of development will produce a better future. One critical obstacle to the effectiveness of their projects is the high expectations of villagers who accept rhetorical claims at face value because they have insufficient information to evaluate potential outcomes. From this perspective, nongovernment organizations and logging companies vie for acceptance at the local level, sometimes generating such intense political conflict over the local distribution of resources that both entrepreneurs and conservationists become immobilized. In such instances, conflict, although undesirable in and of itself, becomes an inadvertent buffer against too rapid development (Filer 1996).

Among those who have worked with local communities, there is broad agreement that conservation alone is not a persuasive argument against industrial logging. Good opportunities for local development are needed as well. Whether resource owners are already informed about the consequences of industrial logging and the need for conservation is not certain. Nor is there agreement about whether information alone is sufficient to persuade people to choose alternative paths to sustainable development. Awareness campaigns are helping people to understand development that allows them to manage rather than deplete their forests (Roughan, Kirsch, this volume). Bryant, Stewart, and Walter's *The Grassroots Impact of the Expatriate Volunteer: A Lesson in the Understanding of Vil-*

lage Development (1982) offers an important case study of small-scale business run by villagers that is "starkly different from . . . the annihilation of the environment and the alienation of the people" portrayed so vividly in De'Ath's account of the Gogol Timber Project (1980). In the account of Stewart's work as a Canadian University Service Overseas volunteer with the Rossun Sawmill in Manus, the enormous dedication to and identification with their project is clear. Obstacles were repeatedly overcome largely through the continuing support the local community gave to its mill and to the efforts of the volunteer director to develop good business practice.

Perspectives in this Volume

The following essays discuss aspects of the logging issue from the multiple perspectives of researchers, government employees, development experts, and conservationists. By emphasizing different aspects of the contemporary scene, they are variously optimistic and doubtful about the future. The five main articles present an analysis for each country (Saulei; Frazer; Regenvanu, Wyatt, and Tacconi) and explore two of the most important responses to logging: integrated conservation and development projects (Kirsch) and agroforestry (Clarke and Thaman).

Simon Saulei, head of the Biology Department at the University of Papua New Guinea, considers the causes and consequences of the extremely rapid increase in logging following the 1979 revision of forest policy. He chronicles the ways in which much of the revenue due to government and resource owners was lost through lack of monitoring. A Swiss company, Société Générale de Surveillance, has been hired to provide this service and to train Papua New Guineans to monitor logging operations. Their efforts have increased the revenue that is captured by the state from current logging operations, even though they are only able to monitor about half of the operating timber projects.

Ian Frazer, an anthropologist who has been doing long-term work on the development of logging in Solomon Islands, traces the rapid increase in rates of logging from below estimated sustainable levels in the 1970s to a current rate that is at least ten times greater than earlier estimates.[9] He describes how the activities of logging companies have produced an interdependent situation that militates against the government protecting its citizens from abusive logging practices. This situation has come about

through a de facto shift in power and administrative authority from public servants to politicians in which the state acts coercively against its citizens in support of logging companies. Long-term economic planning and resource management have been abandoned in favor of short-term expediency. At present, the Solomon Islands Forest Industry Association, a body representing foreign logging companies, has far more influence over government policy than does the Forestry Division.

Ralph Regenvanu, Stephen Wyatt, and Luca Tacconi discuss both the development of logging and resistance to logging in Vanuatu. Much of the resistance to commercial logging has come directly from the resource owners, and has been supported by the first prime minister, Father Walter Lini, as well as the current prime minister, Maxime Carlot Korman. The authors detail evidence for long-term and extensive human impacts on the environment and the incommensurability of customary land tenure and modern systems of contract. Research has shown that many people do not find old forest areas particularly critical for use in daily life. Most of their usable plant materials come from gardens and secondary forests near to villages. Nevertheless, they are committed to retaining areas of old forest as sacred sites and as reminders of a different kind of past. This is in keeping with some of what Clarke and Thaman describe for other island ecosystems, but contrasts with the vast lists of forest materials used by horticultural and foraging groups in many parts of Papua New Guinea (Sekhran and Miller 1995). These differences highlight again the importance of examining local cases and adjusting development and conservation strategies to the great local variation for which Melanesian societies and ecosystems are renowned.

Stuart Kirsch takes up the issue of conservation projects whose goal is to head off logging by providing development opportunities that preserve the environment. The Lakekamu River Basin Project is one such effort, and spans a geographical area exploited by several different cultural groups. Their different claims on the area and goals for development have involved the conservationists (in this case, the Worldwide Fund for Nature) in local politics to a very high degree. This case shows how alternative development efforts are faced with extremely complex negotiations among different interest holders.

William Clarke and Randolph Thaman review the prevailing arguments on agroforestry initiatives in the Pacific Islands. Their premise is that some of the effort now devoted to preserving or protecting natural

forest (a goal that Pacific Islanders, and their governments, often do not share with foreign conservationists) should be turned toward a more achievable target of managing humanized landscapes and ecosystems in order to maintain and incrementally increase their biodiversity. They are less sanguine than many that properly informed resource owners will opt for conservationist rather than industrial approaches to exploiting forested areas, and assume that much of the current forest cover will be lost to logging. Their approach is correspondingly more prescriptive. They suggest that serious consideration be given to restoration of biodiversity through incremental agroforestry—a resource management technique through which suitably adapted plant species are deliberately introduced to enrich existing agricultural land use systems.

The Dialogue section presents more narrowly defined issues and focused points of view. Brian Brunton provides one perspective on logging in Papua New Guinea. John Roughan provides an on-the-ground view of nongovernment organizations' efforts to head off logging abuses in Solomon Islands, and the risks and uncertainty of challenging both government and multinational corporations.

Brunton, interviewed by Barlow, provides insights into the difficulties of regulating forest exploitation through the legal system. By pointing out the neocolonial biases of the current system and its lack of precedents, he clarifies how much illegal logging already has occurred and continues to take place. Using the case of Slater and Gordon against Broken Hill Proprietary Limited (the Australian company that manages Ok Tedi Mining Limited), he explains how it may well set a crucial precedent for claiming certain kinds of environmental damages against foreign companies.

Roughan, founder of Solomon Islands Development Trust, documents the role of this nongovernmental organization in working with village communities on environmental and development issues and its efforts to help them resist exploitation. Resource owners are becoming more resistant to pressure from logging companies as the government becomes increasingly coercive. Resistance to government support of large-scale logging disrupts logging activities, thereby slowing the rate of timber extraction, but the political pressure through which this is happening severely undermines the stability of democratic government. This situation is well illustrated by the case of Pavuvu Island.

Jamon Halvaksz and Elizabeth Hochberg summarize recent literature on logging according to the following broad categories: policy and legis-

lation, forest management practices, the social impact of logging, and conservation and biodiversity. They also note some glaring gaps in research, and consequently in the literature, such as gender and generational differences in attitudes toward logging. In-depth case studies of communities are important for understanding the complex processes involved in forest exploitation. Because of space limitations and production costs for this very large issue, three dialogue pieces dealing with Papua New Guinea had to be omitted late in production. We regret being unable to include the valuable perspectives of Hartmut Holzknecht on land and resource-owner issues, Philip Siaguru on forest policy, and Glen Barry on conservationist communication networks from villages to the Internet.

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Notes

1 An important new publication edited by Filer and Sekhran (nd) contains case studies and other perspectives that address some of these lacunae.

2 Melanesian countries include Fiji, Kanaky (New Caledonia), Vanuatu, Solomon Islands, and Papua New Guinea.

3 Old-growth forests are those that have not been commercially logged, as distinguished from "pristine" or "virgin" forests, which are, according to most accounts, virtually nonexistent. Even the most remote forests have long been inhabited by foragers or swidden horticulturalists who clear only small patches of forest for use in rotational gardening cycles.

4 Western Pacific rainforests represent an important carbon sink that helps to maintain the greenhouse gas balance and contributes to climatic stability, notably in relation to El Niño cycles. They are home to both genetic capital and ancestral lineages of important food crops (Sekhran and Miller 1995, 37f).

5 For example, ornithologists conducting a study of a large oil-palm plantation in Papua New Guinea observed only two species of birds in the entire area—this in a country that has one of the highest numbers of endemic bird species in the world (Mary Le Croy, personal communication 1996).

6 This report profiles trends in Japan's tropical timber imports from 1988 to 1995 and is available on the Internet in Gaia Forest Conservation Archives at URL=http://forests.lic.wisc.edu/forests/gaia.html.

7 The main types of commercially valuable wood (approximately 40 of over 400 species) from Papua New Guinea forests are kwila, rosewood, walnut, kamarere *(Eucalyptus deglupta),* calophyllum (PNG DF 1989), pencil cedar, wau beech *(Elmerillia papuana),* ebony, cordia, and others (PNG OF 1977). The 1977 report states that conifers, ebony, and cordia are banned from export as logs. (See also Sekhran and Miller 1995, 167; Cameron and Vigus 1993.)

8 We have compiled a list of these references from the Gaia Forest Conservation Archives. It is current as of fall 1995 and available on request.

9 Nadarajeh (1994) discussed the problem of sustainability estimates, which are somewhat arbitrarily based on estimated regrowth cycles of 35 to 45 years and usually consider maximum regrowth under optimal conditions of soil, climate, disturbance, etc. There is considerable skepticism concerning sustainability estimates, both because actual regrowth does not mimic the systemic complexity or biological diversity of what was cleared, and because the length of time and conditions for regrowth are often less than optimal.

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